CHEM C180: GENERAL CHEMISTRY A

Item	Value
Curriculum Committee Approval Date	04/26/2024
Top Code	190500 - Chemistry, General
Units	4 Total Units
Hours	72 Total Hours (Lecture Hours 72)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)
Local General Education (GE)	• CL Option 1 Natural Sciences (CB1)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5A Physical Science (5A)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5A Physical Science (5A)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B1 Physical Science (B1)

Course Description

Introduction to both the principles and mathematical analysis of general chemistry and basic lab techniques, especially for students intending to proceed with further chemistry courses. Topics include atomic structure and bonding, the stoichiometry of chemical equations, thermochemistry, and the behavior of gases and solutions. PREREQUISITE: CHEM C130 or a recent high school chemistry course with a grade of C or better, and a course taught at the level of intermediate algebra or appropriate math placement. COREQUISITE: CHEM C180L. Transfer Credit: CSU; UC: Credit Limitations: no credit for CHEM C110 if taken after CHEM C180 or CHEM C220; no credit for CHEM C130 if taken after CHEM C180 or CHEM C220; no credit for CHEM C140, PHYS C140 if taken after CHEM C180 or CHEM C220. C-ID: CHEM 110, CHEM 120 S.**C-ID:** CHEM 110, CHEM 120 S.

Course Objectives

- 1. Use simple algebraic methods to solve computational problems in unit conversion, dimensional analysis, thermochemistry, stoichiometry, gas laws, solutions, and pH.
- 2. Write and balance chemical equations and correctly formulate and name ionic and molecular compounds.
- 3. Calculate reaction enthalpies using calorimetry, Hess Law, heats of formation, or bond energies.
- 4. Use electron configurations to construct Lewis dot structures and utilize VSEPR theory to predict the shape of molecules.
- 5. Describe the nature of solids, liquids and gases, and phase changes.

Lecture Content

Matter and measurements Unit conversions, dimensional analysis, significant figures Density; temperature scales Atoms, Molecules and Ions Atomic symbols; chemical formulas Ionic formulas Chemical Formulas and Equations Balancing chemical equations The Mole; molar mass, Percent composition and empirical formula Thermochemistry Energy Quantitative energy calculations Gas Laws Boyles Law, Charles Law, Avogadros Law, Ideal Gas Law Stoichiometric Gas Law calculations Electronic Structure of Atoms Interaction of Electromagnetic energy and matter Bohr model of the atom Electron configurations and valence electrons Periodicity Atomic size, Ionization energy and electron affinity Bonding and Molecular Structure Lewis dot structures VSEPR Solutions Molarity calculations Dilution Acids and Bases Definitions of Acids and Bases pH Colligative Properties of Solutions Henrys Law Freezing point depression and boiling point elevation

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)

Instructional Techniques

Method of Instruction: Lecture with interactive discussion Models, use of periodic table, videos

Reading Assignments

Textbook reading and problem-solving exercises

Out-of-class Assignments

Problem solving analysis

Demonstration of Critical Thinking

Explaining a detailed analysis of scientific data

Required Writing, Problem Solving, Skills Demonstration

Completion of mathematical problems in stoichiometry, gas laws, and other topics.Balancing equations, drawing and interpreting graphs.

Eligible Disciplines

Chemistry: Masters degree in chemistry OR bachelors degree in chemistry or biochemistry AND masters degree in biochemistry, chemical engineering, chemical physics, physics, molecular biology, or geochemistry OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Zumdahl, Steven S.; Zumdahl, Susan A. Chemistry, 11th ed. Cengage Learning, 2024 Rationale: - 2. Required Flowers, P, Theopold, K., Langley, R., Robinson, W.R.. Chemistry:2E, 2E ed. Houston, TX: OpenStax, 2024

Other Resources

1. Coastline Library